The
WMO Space Programme

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Satellite Direct Readout Conference

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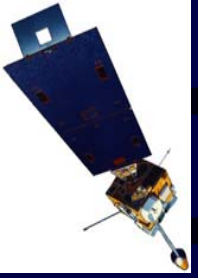
Outline

→ • WMO Structure
- Status of the WWW's space-based sub-system GOS
- WMO Space Programme
- WMO Space Programme Implementation
- Towards an integrated WMO global observing system (WMO – IOS)



Purposes of WMO

To promote and foster meteorology, hydrology, and related geophysical sciences and to facilitate world-wide cooperation for the benefit of humankind:

- **Networks for meteorological / hydrological and other geophysical observations;**
- **Standardization of observations and publications;**
- **Development of operational hydrology;**
- **Systems for processing and rapid exchange of data;**
- **Applications for socio-economic development (transportation, water, agriculture, oceans, pollution control, etc), environment protection, and policy formation;**
- **Disaster prevention and mitigation;**
- **Research and training.**

Organizational Structure

- *Congress*, supreme body, determines the future policy (meets every 4 years)
- *Executive Council*, 37 directors of meteorological or hydrometeorological services. They act in their individual capacities (meets annually)
- *Regional Associations* (6) - address regional concerns
- *Technical commissions* (8) - technical experts make recommendations on scientific or technical issues within the purposes of WMO
- *Secretariat* with regional (3) and subregional (4) offices

WMO Programme Structure

World Climate Programme

Atmospheric Research and Environment Programme

Applications of Meteorology Programme

Hydrology and Water Resources Programme

WMO Space Programme

Natural Disaster Prevention and Mitigation Programme

World Weather Watch Programme

Education and Training Programme

Technical Cooperation Programme

Regional Programme

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Space-based sub-system of GOS (2004)

•Geostationary

- EUMETSAT
  - Meteosat-8 at 10.5°W
  - Meteosat-7 at 0°
  - Meteosat-6 at 10°E
  - Meteosat-5 at 63°E
- Japan
  - GMS-5 at 140°E
- People's Republic of China
  - FY-2B at 105°E
- Russian Federation
  - GOMS-N1 at 76°E
- United States of America
  - GOES-12 at 75°W
  - GOES-11 at 103°W
  - GOES-10 at 135°W
  - GOES-9 at 155°E
  - GOES-8 at 165°E

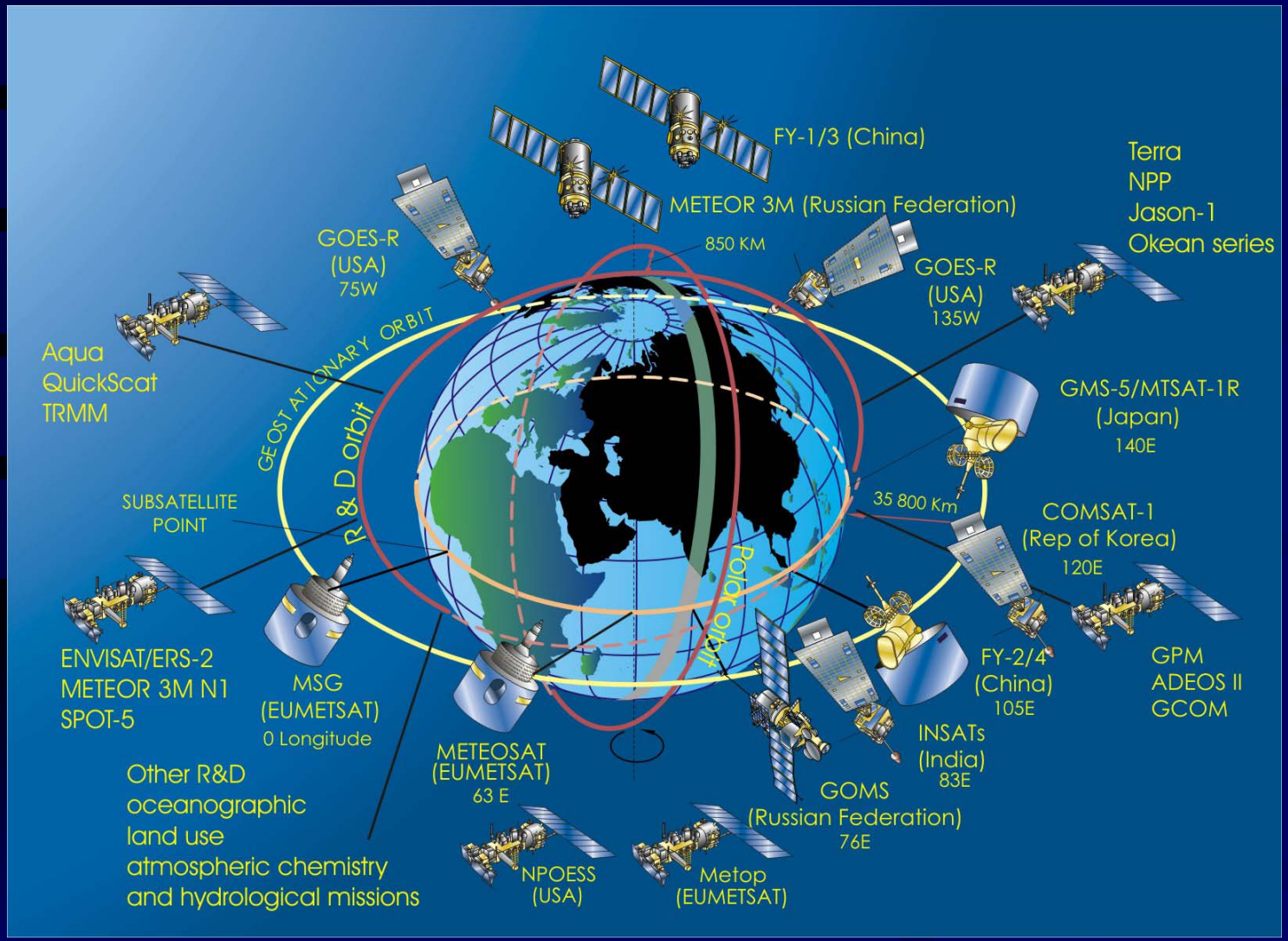
•Polar Orbiting

- People's Republic of China
  - FY-1C, 1D series
- Russian Federation
  - METEOR series
- United States of America
  - NOAA series

• R&D

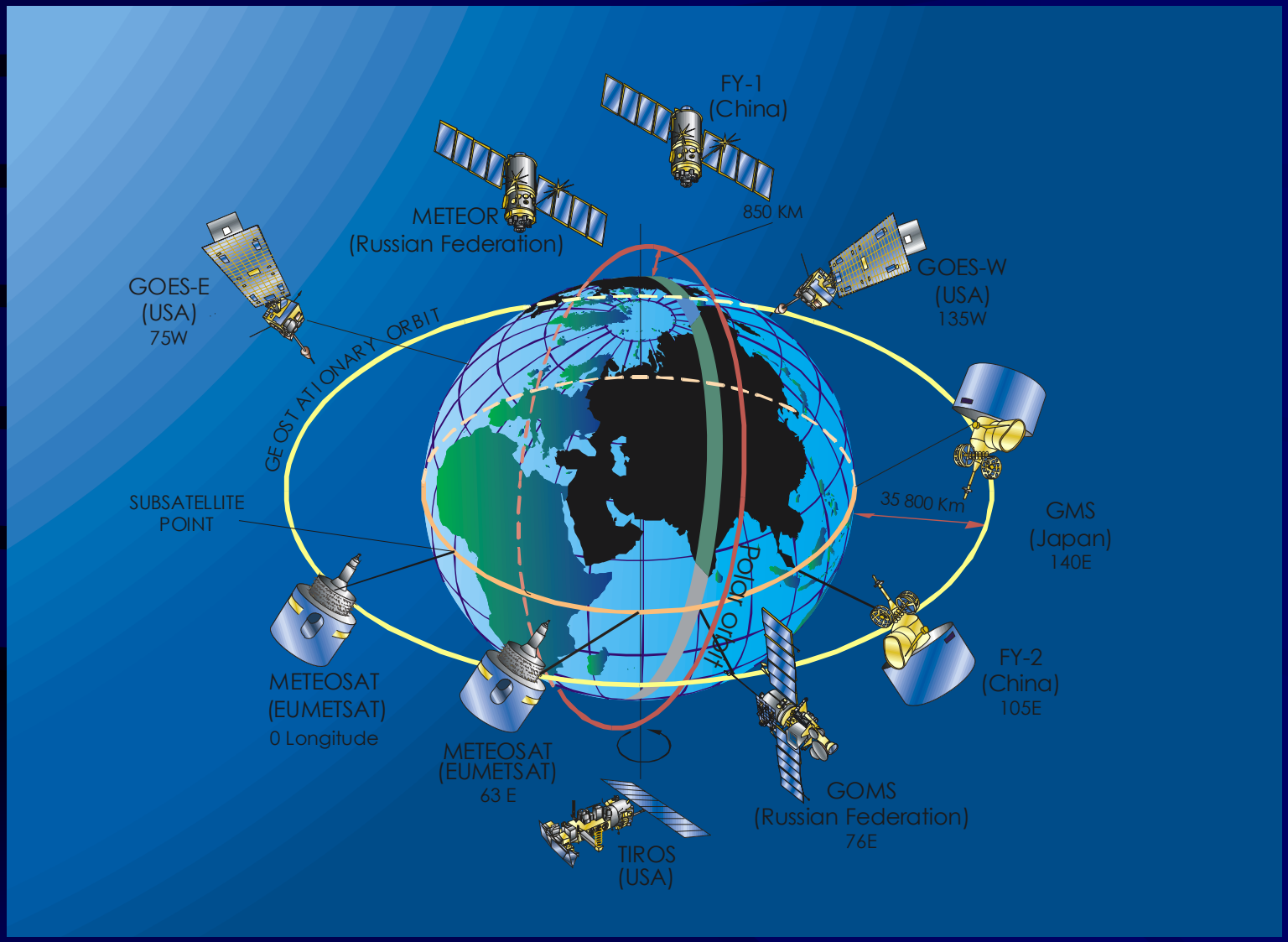
- CNES
- ESA
- JAXA
- NASA
- Roskosmos
- …

WMO space-based sub-system of the WWW's Global Observing System (2004)



Unparalleled international cooperation has been achieved in satellite activities*

Space-based component of GOS (2000)



Status of the WWW's space-based component GOS

Standing members

- operational satellite operators

Newest members

- NASA – Aqua, Terra, NPP, TRMM, QuickScat
- JAXA – GCOM series
- ESA – ERS 1 and 2, ENVISAT
- Roskosmos – METEOR 3M N1 (R&D inst), OKEAN series
- CNES – Jason-1, SPOT-5
- IMD – INSAT series
- Republic of Korea – COMSAT-1

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WMO Space Programme

Fourteenth WMO Congress (May 2003):

- Recognized *critical and fast growing importance of data, products and services provided by WWW's expanding space-based component of the GOS* to WMO Programmes and supported Programmes
- Decided to initiate a *new major WMO Space Programme as a cross-cutting programme* to increase the effectiveness and contributions from satellite systems
- CBS lead Technical Commission

International coordination

- CGMS (Coordination Group for Meteorological Satellites)
- CEOS (Committee on Earth Observation Satellites)
- IGOS (Integrated Global Observing Strategy) Partnership
- COPUOS (UNISPACE III)
- GEO and its GEOSS (WWW's space-based GOS, a major GEOSS component)

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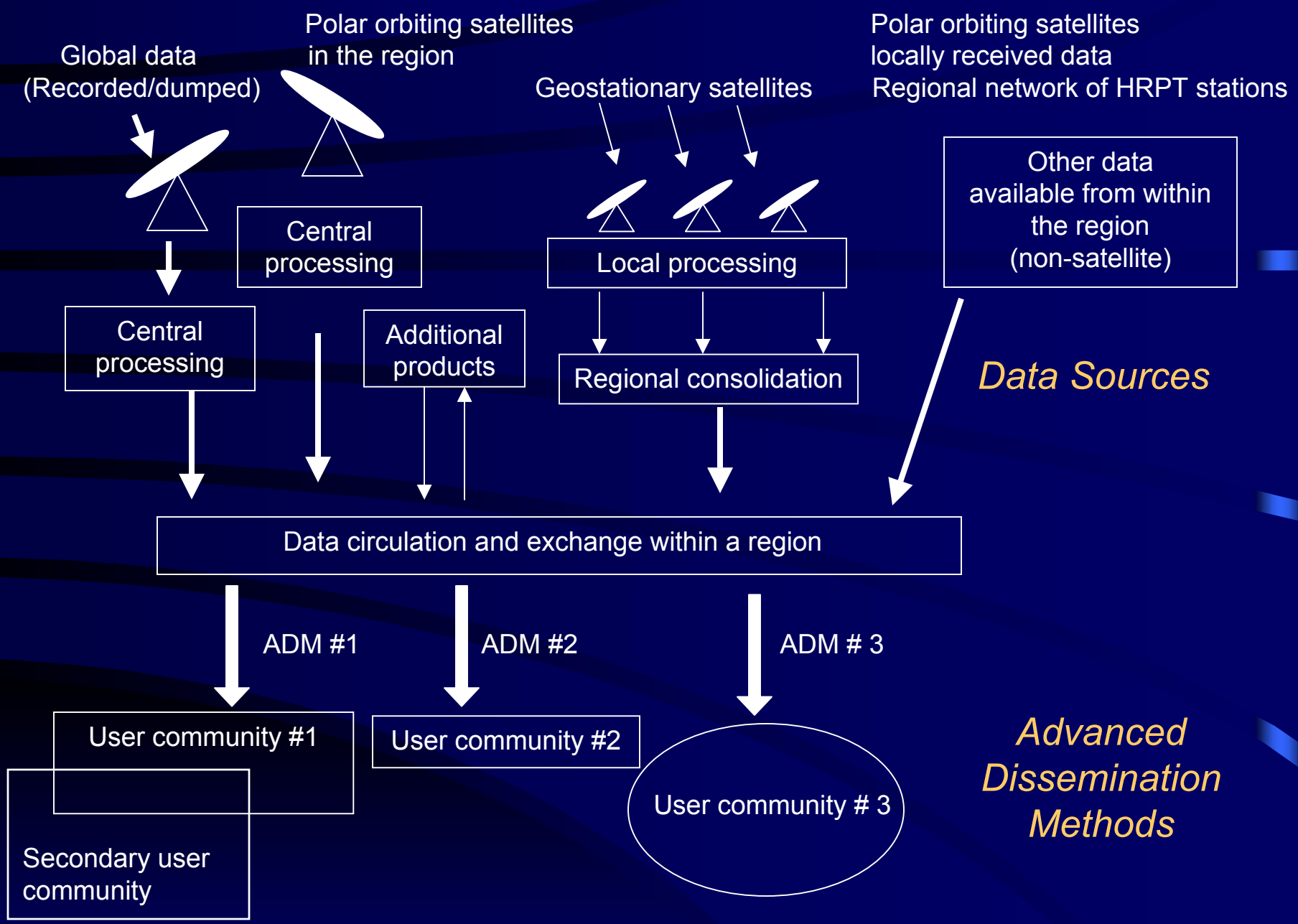
WMO Space Programme Implementation

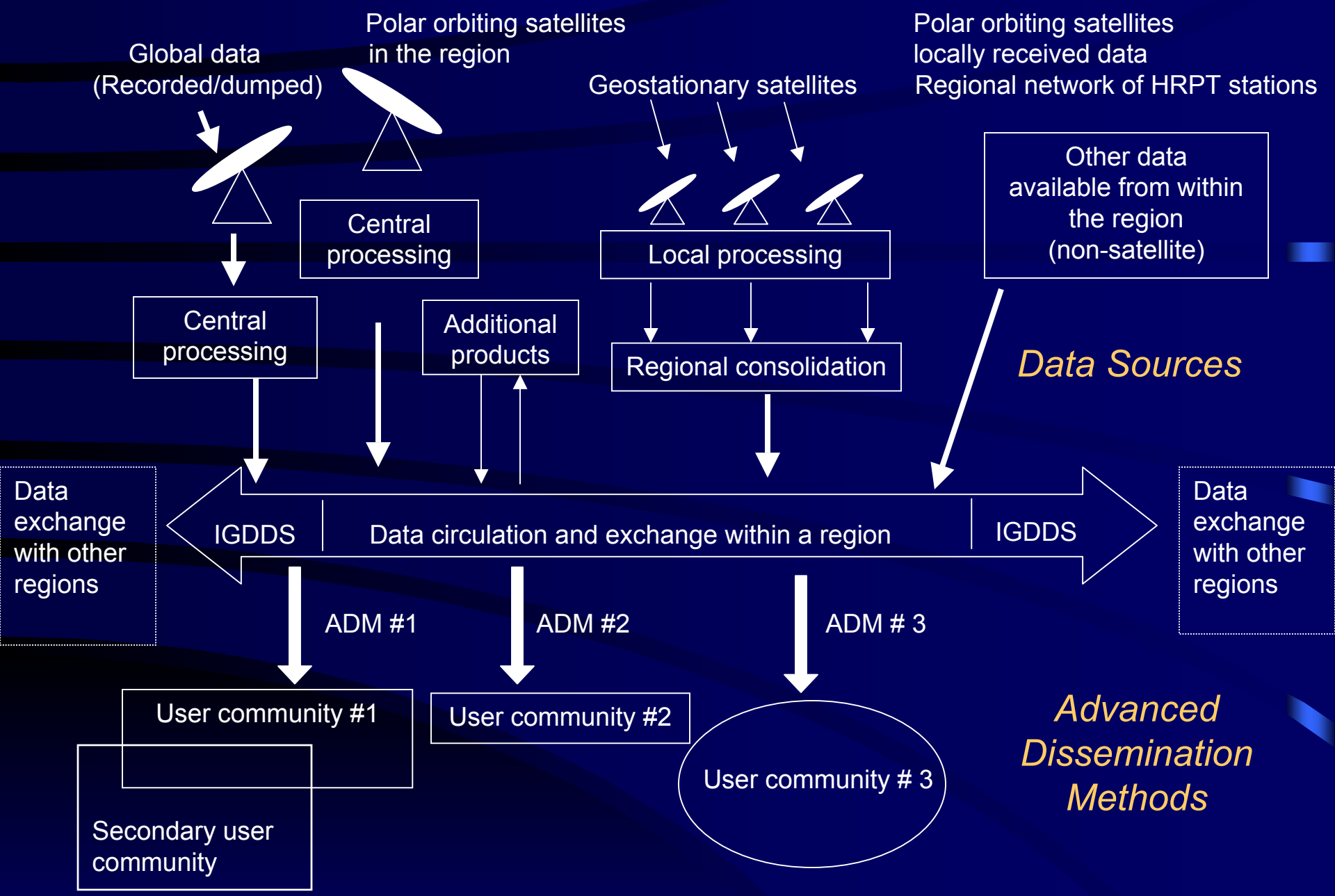
- Coordination with space agencies within CGMS and CEOS
- Organization for new WMO Expert Team on Satellite Systems
- Development WMO portions 10-Year Implementation Plan for GEOSS
- Interaction with the WMO Expert Team on Evolution of the GOS
- Preparation for symposia to identify R&D satellite data and products for transition to operational satellites
- Continuation & Expansion of Virtual Laboratory for Education and Training in Satellite Meteorology

Increased real time access to satellite data

- EUMETSAT ATOVS Retransmission Service (EARS) has increased ATOVS real time access in Northern Hemisphere
- Access to near real time ATOVS data important for WMO activities such as implementation planning for the redesign (evolution) of the GOS and THORPEX
- EARS extremely effective example of ADM
- Need to extend coverage into Southern Hemisphere
- WMO Space Programme to act as catalyst to form local consortia (Regional ATOVS Retransmission Services) similar to EARS
- WMO SG written to CGMS and WMO Members
- IGDDS to link regional ADMs into a global data dissemination service
- First WMO RARS/IGDDS planning meeting 16-17 December 2004 hosted by EUMETSAT with key global participation



An ADM in a Region



ADMs in an Integrated Global Data Dissemination Service (IGDDS)

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Towards an integrated WMO global observing system (WMO – IOS)

- CM-4 recommendation for EC-XLVI (June 2004) consideration

- Space-based sub-system of an integrated WMO global observing system

  - operational meteorological polar orbiting satellites
  - operational meteorological geostationary satellites
  - environmental Research and Development satellite constellations

- Three Earth-system domains and two cross-cutting sets of requirements for atmosphere, ocean, land, climate and natural disaster reduction

Towards an integrated WMO global observing system (WMO – IOS) (continued)

Three Earth-system domains

Atmosphere meeting the needs of

- operational WWW, aviation meteorology (CAeM) and agricultural meteorology (CAgM)
- weather research WWRP (CAS)
- atmospheric chemistry, GAW – CAS

Ocean meeting the needs of

- Global Ocean Observing System (GOOS)
- JCOMM

Towards an integrated WMO global observing system (WMO – IOS) (continued)

Three Earth-system domains (continued)

Land surface and fresh water meeting the needs of

- World Hydrological Cycle Observing System (WHyCOS)
- Hydrology and Water Resource Programme (HWR) as articulated through CHy
- WMO-co-sponsored Global terrestrial Observing System (GTOS)
- CAgM

Towards an integrated WMO global observing system (WMO – IOS) (continued)

Two cross-cutting sets of requirements

Climate, incremental to, and integrating across, the domain-based observing systems meeting the needs of

- climate research, (WCRP)
- climate policy, articulated through SBSTA, COP, based on information from IPCC etc.
- climate monitoring and services, articulated through CCl, CAgM, CHy

Natural disaster reduction, incremental to, and integrating across, the domain-based observing systems to support WMO Natural Disaster Prevention and Mitigation Programme

Exciting times for WMO Members

- Space-based component of the GOS continues to expand
- Provides valuable satellite data, products and services more so than ever before in the history of the World Weather Watch
- WMO established a new *WMO Space Programme*
- Efforts towards an integrated WMO global observing system
- WMO Space Programme Implementation Activities

Thank you